

the intestines of the Emu are seen to be covered by a horizontal septum, which resembles that of the Crocodiles except that it does not arise from the dorsal median line but along two lines placed nearer to the lateral parietes; the relations of the posterior region of the oblique septum to the omentum are represented diagrammatically in the accompanying drawing (fig. 2, p. 257). These facts, then, support my contention that *the omentum as well as the oblique septa of birds are to be derived from the fibrous expansion which covers over the viscera in the Crocodilia.*

They also suggest that *the oblique septum of birds has been produced by a vertical fold of this fibrous expansion* which became attached to the ventral parietes and ultimately lost all traces in most birds (?) of its primitively double nature, and not by a separation of part of it.

4. Observations on the Fishes of India.—Part I.

By FRANCIS DAY, C.I.E., F.Z.S.

[Received April 13, 1888.]

During the ten years that have elapsed since the completion of my work upon the 'Fishes of India,' several new piscine forms have been obtained, both from the seas and fresh waters of that part of Asia. Extended observations among specimens preserved in the Museums of Europe have likewise convinced me that some species which I formerly considered to be undescribed have no title to that designation, while several of my new ones have been redescribed as novelties by others. The foregoing reasons would scarcely have induced me to recur again to this interesting fish-fauna had it not been that it is proposed to re-issue my work in a more portable size, better suited to the requirements of travellers and collectors. As the subject of the geographical distribution of these fishes will have to be considered, I am obliged to point out not only such forms as I have erroneously described to be new, but likewise to advert to those of other describers which I believe would come under this head.

CROMILEPTES ALTIVELIS.

Serranus altivelis, Cuv. & Val.

? *Serranus striolatus*, Playfair, Fish. Zanzibar, p. 11, pl. iii. f. 2.

? *Serranus gibbosus*, Boulenger, P. Z. S. 1887, p. 654.

The figure of *Serranus altivelis* in Cuv. & Val. ii. pl. xxxv. shows the spines of the dorsal fin increasing in length to the last, which is delineated nearly twice as long as the second. Cantor, in his 'Malayan Fishes,' remarked that these spines from the third were of nearly equal length; Bleeker shows them slightly, but gradually augmenting to the last, which is figured as one fifth longer than the third: I have observed them more nearly corresponding with Cantor's description. The foregoing shows that differences do exist as to the length of these spines, and that a gradual augmentation from the

third to the last is not carried out in a similar manner in all specimens.

The specimen of *S. striolatus* is stuffed, and the ends of the 3rd, 4th, and 10th dorsal spines are broken; the 3rd and 4th are said to be the longest and one third the length of the head, thus differing from *S. altivelis*: the last dorsal spine is rather more than half the length of the longest ray ($\frac{1.4}{2.4}$). The soft portions of the dorsal and anal fins are similar to *S. altivelis* and *S. gibbosus*; the pectoral is shorter than in *S. gibbosus*, which is nearly as long as in *S. altivelis*.

The specimen of *Serranus gibbosus* is of very similar form to the foregoing, which may be owing to having been preserved in strong spirit instead of being a skin; its third dorsal spine is nearly as long as the longest ray, but its last spine is broken. The length of its head (from the end of the snout to the end of the opercular spines) is $4\frac{1}{4}$ in that of the total length. The colours are between the two others; its spots are larger in size than in *S. striolatus*, but having a similar tendency to form about 15 irregular rows along either side of the body.

I think the Zanzibar and Muscat fishes are merely separated from one another by their colours, and that their form differs from *C. altivelis* in the shorter lengths of their dorsal spines. This fish does not appear to extend to the Red Sea; consequently if *S. striolatus* and *S. gibbosus* are varieties of *S. altivelis*, they are found in the extreme limits at which this species extends to the west. Without, therefore, absolutely holding them to be identical, I think that when a larger number of specimens have been obtained they will probably only be ranked as varieties.

SERRANUS DIACANTHUS, Cuv. & Val.

Epinephelus retouti, Bleeker, Fish. Madagascar, p. 21, pl. xii. f. 1.

SERRANUS LATIFASCIATUS, Schlegel.

Serranus grammicus, Day, Proc. Zool. Soc. 1867, p. 700.

Since my description of this fish was published, I have seen Schlegel's types in the Leyden Museum, and they undoubtedly belong to this species.

SERRANUS MORRHUA, Cuv. & Val.

Serranus præopercularis, Boulenger, *l. c.* p. 654.

As I have already given an account of the colours of this fish, I will merely remark that the young have sinuous white bands, but as the fish becomes older it assumes a brown colour, with narrow black lines, which were the original borders of the white bands. In the Paris Museum is a young specimen having dark spots along the lines which bound the white bands. In Klunzinger's figure (Fisch. Roth. Meeres., t. i. f. 2), three brown lines radiate from the eye and become four curved ones on the body, the first going to the 8th dorsal spine, the second to the 5th ray, while between these are blotches, spots, or markings of the same colour. The fifth dorsal spine is shown the longest.

In *S. præopercularis* the colour differs, the lines being more or less broken up into spots; but if the smaller of the two specimens (12 inches in length) is examined, it has the distinct remains of the black lines which edge the bands on the head, as shown in my 'Fishes of India,' while the opercular spines are similarly placed to those in *S. morrhua*.

As regards colours, it is by no means unusual that vertical bands in these fishes have a tendency to disappear, and horizontal lines to break up into spots, and even entirely fade away.

GRAMMISTES PUNCTATUS, Cuv. & Val.

Sent by Dr. Bidie from Madras in 1883.

LUTIANUS ARGENTIMACULATUS, Forsk.

Mesoprion garretti, Günther, Fische d. Südsee, p. 15, t. xiii. f. B.

APOGON ELLIOTI, Day.

Apogon arafuræ, Günther, 'Challenger' Shore-fishes, 1880, p. 38, pl. xvi. f. C.

SYNAGRIS TÆNIOPTERUS, Cuv. & Val.

Synagris notatus, Day, Proc. Zool. Soc. 1870, p. 684.

GERRES SETIFER, Ham.-Buch.

Gerres altispinis, Günther, Intr. Study of Fishes, with a figure.

PEMPHERIS MALABARICA, Cuv. & Val.

Pempheris mangula, Day, Fish. India, p. 175.

PEMPHERIS RUSSELLI.

Pempheris molucca, Day, Fish. India, p. 175.

This species is identical with Russell's fish, plate xiv., but not with *P. mangula*, Cuv. & Val., a form figured in Günther's Fische d. Südsee, t. lix. f. B, whereas Klunzinger's *P. mangula* differs again from both species.

UMBRINA SINUATA, Day.

Umbrina striata, Boulenger, P. Z. S. 1887, p. 660.

TRACHYNOTUS RUSSELLI, Cuv. & Val.

Trachynotus coppingeri, Günther, Fish. Alert Exp. 1881-82, p. 29, pl. iii. f. A.

PSENES JAVANICUS, Cuv. & Val.

Psenes guamensis, Günther, Fische d. Südsee, ii. p. 145, t. xci. f. 100.

PERCIS CYLINDRICA, sp. nov.

B. vi. D. 5/21. P. 15. V. 1/5. A. 17-18. C. 15. L. l. 44.
L. tr. 2½/9.

Length of head 4, of caudal fin 5½, height of body 5¼ in the total

length. *Eyes*: diameter $3\frac{1}{2}$ in the length of the head, 1 diameter from the end of the snout, and $\frac{1}{4}$ of a diameter apart. The greatest width of the head equals its length excluding the snout. Cleft of mouth very slightly oblique; lower jaw a little the longer; the posterior extremity of the maxilla reaches to beneath the first third of the orbit. The greatest depth of the preorbital equals one third of the diameter of the eye. All the opercles entire; a well-marked spine on the opercle, and another on the subopercle; no shoulder-spine. *Teeth*: two enlarged ones on either side above the symphysis of the lower jaw; fine ones on the vomer. *Fins*: second dorsal spine the longest, equalling three fourths of the diameter of the eye. Pectoral nearly as long as the head. Ventral one fourth longer than the head, reaching the base of the seventh anal ray. Caudal slightly rounded. *Colours*: reddish brown, with five wide and dark vertical bands, extending from the back to the lower surface, these bands being darkest at their edges and disappearing about the middle of the body, where there are also some dark spots; a brown ocellus at the upper part of the base of the caudal fin, which has some brown spots on it. Numerous brown spots on the snout and upper surface of the head and cheeks, some on the upper edge of the eye, where there are two dark narrow bands. Ventrals white; first dorsal fin nearly black between the spines; soft dorsal and anal with fine dots between the rays.

Hab. Two small specimens from the Andaman Islands.

GوبيUS LITTOREUS, sp. nov.

B. v. D. 6/11. P. 15. V. 1/5. A. 10. C. 14. L. 1. 22.
L. tr. 6.

Length of head $4\frac{1}{2}$, of caudal fin $4\frac{1}{2}$, height of body $5\frac{1}{2}$ in the total length. *Eyes*: diameter 3 in the length of the head, $\frac{1}{2}$ a diameter from the end of the snout, and placed close together. The greatest width of the head equals $\frac{2}{3}$ of its length, while its height equals its length excluding the snout. Anterior profile of the head somewhat obtuse; cleft of mouth oblique, lower jaw slightly the longer; the posterior extremity of the maxilla reaches to beneath the first third of the eye. Preopercle spineless, and no warts on the head. *Teeth* in villiform rows, none enlarged. *Fins*: dorsal spines of moderate strength, the longest nearly half the length of the head; pectoral as long as the head, some of its rays fine and silk-like; caudal pointed. *Scales* ctenoid, none on the head; eleven rows between the occiput and front edge of the dorsal fin. *Colours*: yellowish, with a few dark spots on the body and a dark band from the eye to the snout, also a dark mark on the opercle. Upper half of eye black. Dorsal, anal, and caudal fins with a grey outer edging; ventrals white.

Hab. A small species from Madras.

ELEOTRIS MACROLEPIDOTA, Bloch.

This fish is not *Eleotris hoedtii* of Bleeker, as stated in Günther's
PROC. ZOOLOG. SOC.—1888, No. XIX.

Fische Südsee,' ii. p. 185, as the type at Berlin (No. 2155) has D. $7\frac{1}{8}$, A. $\frac{1}{10}$ (the last ray in both being almost double, and therefore counted as two by Bloch), L. 1. 30, L. tr. 13-14, and from 27 to 28 scales between the snout and the first dorsal fin.

ELEOTRIS ELLIOTI, sp. nov.

Cul nachooli, Tamil.

B. vi. D. 6/12. P. 21. V. 6. A. 13. C. 13. L. 1. 80.
L. tr. 16.

Length of head $4\frac{1}{2}$, of caudal fin $4\frac{2}{3}$, height of body $5\frac{1}{2}$ in the total length. *Eyes* high up, diameter $3\frac{1}{2}$ in the length of the head, 1 diameter from the end of the snout. Height of head two thirds of its length; interorbital space narrow. Cleft of mouth somewhat oblique, the maxilla extends posteriorly to beneath the middle of the eye. *Teeth* rather large, in a single row in the upper jaw, with two small lateral canines, in two or three rows in the centre of the lower jaw, separated from the single lateral row by two large, recurved, canines. *Fins*: dorsal spines thin, flexible, and equal in height to the body below them; second dorsal and anal of similar height and one third lower than the first dorsal. Pectoral nearly as long as the head. Caudal rounded, with its central rays somewhat the longest. *Scales*: ctenoid in the posterior portion of the body, where they are larger than anteriorly, small on the surface of the head; none on the cheeks. *Colours*: whitish, with fine wide and light-coloured chestnut bands descending from the back, each of which has a black outer edge; another over the nape is without dark edges. Caudal fin brown, with a broad, yellowish, black-bordered vertical band down its centre. A dark horizontal band running along the cheeks below the eye. Dorsal fins light brown, with light outer edges, a large black white-edged blotch on the posterior half of the first dorsal fin, and a second but smaller one at the termination of the second dorsal, which last fin is white at its base.

Hab. Madras.

A skin from Sir W. Elliot's collection is 3.2 inches in length, but is in bad condition; a coloured drawing was made from the fish when captured.

PETROSCRITES STRIATUS, sp. nov.

B. vi. D. 40. P. 13. V. 3. A. 27. C. 10.

Length of head $4\frac{3}{4}$, of caudal fin $6\frac{3}{4}$, height of body 6 in the total length. *Eyes*: diameter $2\frac{2}{3}$ in the length of the head, $\frac{2}{3}$ of a diameter from the end of the snout, and the same distance apart. The greatest width of the head equals half its length; the maxilla reaches to beneath the first third of the orbit. Snout somewhat broad and rounded in front, the upper jaw a little the longer. No tentacles on the head. *Teeth*: an exceedingly large recurved canine on either side of the lower jaw, while about 14 teeth are present between the canines. *Fins*: dorsal commences midway between the eye and the hind edge of the opercles, and does not extend quite so far as

the caudal fin; the height of its longest ray equals two thirds of that of the body, and is rather more than those in the anal fin, which latter is not united to the caudal. *Colours*: with about ten broad vertical bands, extending from the base of the dorsal to the anal fins, separated from one another by a very narrow white line. Dorsal and anal fins externally black-edged, and the membranes studded with fine brown spots. Caudal light-coloured.

Hab. Ceylon.

SALARIAS SINDENSIS, sp. nov.

B. vi. D. 13/20. P. 14. V. 2. A. 23. C. 12.

Length of head 5, height of body 5 in the total length. *Eyes* situated high up near the dorsal profile, diameter $\frac{1}{4}$ of the length of the head. Body strongly compressed, profile from above the orbit to the end of the snout oblique. The height of the head equals its length excluding the snout. The posterior extremity of the maxilla reaches to beneath the front edge of the eye. No tentacles or crest on the head. *Teeth* well developed large posterior canines. *Fins*: dorsal not notched, but highest posteriorly, where the longest rays equal half the height of the body, anal not quite so high as the soft dorsal; dorsal, anal, and caudal rays unbranched. The dorsal and anal fins not quite connected to the caudal. *Colours*: olivaceous; four wide brown bands on the head, the three anterior of which encircle it; about twelve vertical bands on the body more or less distinct, but more marked at the base of the dorsal fin. Dorsal fin with a dark mark along its anterior two thirds; anal black-edged, each ray tipped with pure white. In one there appear to be marks of some narrow horizontal bands having existed along the front half of the body.

Hab. Three specimens from Kurrachee in Sind.

SALARIAS NEILLI, sp. nov.

B. vi. D. 12/17. P. 13. V. 2. A. 19. C. 10.

Length of head $4\frac{1}{2}$, height of body $4\frac{1}{2}$ in the total length. *Eyes* situated high up, near the dorsal profile, 4 diameters in the length of the head, 1 diameter from the end of the snout, and $\frac{1}{2}$ a diameter apart. Frontal profile very steep, the head as high as it is long, the maxilla reaches to beneath the last third of the eye. A fringed supraorbital tentacle about twice as long as the eye; a small fringed one at the nostril; no crest on the head. *Teeth*: a very large curved canine posteriorly in the lower jaw, and a smaller curved one in the upper. *Fins*: spinous portion of dorsal fin lower than the rayed part, the notch between the two parts of the fin well marked; the longest dorsal rays are equal to half the height of the body of the fish; neither the dorsal nor the anal fin are attached to the caudal, which latter is somewhat wedge-shaped, and its rays are branched. *Colours*: olive, with seven or eight short dark bands descending from the dorsal fin down the first third of the body; some dark bands radiate from the eye; a large black blotch below

and somewhat behind the orbit. Two semicircular brown bands across the lower surface of the mandibles. Fins darker than the body.

I have named this fish after A. Brisbane Neill, Esq., to whom I am under great obligations for the valuable assistance he has given me in my ichthyological publications.

Hab. Ten examples from Kurrachee in Sind.

SALARIAS BREVIS, Kner, 1868.

Salarias leopardus, Day, P. Z. S. 1869, p. 518.

ACANTHOCLINUS INDICUS, sp. nov.

B. vi. D. 21/4. P. 16. V. 1/3. A. 10/14. C. 17.
L. l. 40. L. tr. 14.

Length of head 4, of caudal fin 5, height of body 3 in the total length. *Eyes*: diameter $\frac{1}{5}$ of the length of the head, 1 diameter from the end of the snout, and $\frac{3}{4}$ of a diameter apart. Cleft of mouth somewhat oblique, the maxilla reaching posteriorly to beneath the hind third of the orbit. Two strong opercular spines. *Teeth* in jaws, vomer, and palate. *Fins*: dorsal spines strong, the fin not united to the caudal; pectorals rounded; ventrals long and inserted slightly in front of the base of the pectoral; caudal rounded. *Scales* cycloid. *Lateral line* absent. *Colours*: brownish black, with a milk-white band commencing on the front end of the dorsal fin, and extending to the snout; a white band over the free portion of the tail; a white spot on the base of the pectoral fin, one on either side of the base of the mandibles, one on the isthmus. The posterior half of the ventral fin, and also a ring round the vent, white, as well as the tip of the caudal fin.

Hab. Madras. A small species.

MUGIL KLUNZINGERI, sp. nov.

Mugil carinatus, Day, Fishes of India, p. 349, not C. & V., as was pointed out by Klunzinger.

PLATYGLOSSUS ROSEUS, sp. nov.

B. vi. D. 9/12. P. 14. V. 1/5. A. 2/12. C. 14. L. l. 28.
L. tr. $\frac{2\frac{1}{2}}{10}$.

Length of head $4\frac{1}{3}$, of caudal fin $6\frac{1}{4}$, height of body $3\frac{3}{4}$ in the total length. *Eyes*: diameter $\frac{1}{4}$ of the length of the head, $1\frac{1}{4}$ diameter from the end of the snout, and one apart. The greatest width of the head equals half its length. *Teeth*: a posterior canine. *Fins*: caudal slightly rounded; the length of the pectoral equals that of the head behind the middle of the eye; outer ventral ray somewhat elongated. *Scales*: none on the head, those on the chest smaller than those on the body. *Colours*: in a spirit-specimen rosy, with a large black spot behind the middle of the eye, and a small one between the first two dorsal spines; two narrow light bands pass from the eye to the snout; a broad orange band along the

suborbital ring of bones; body with dark and narrow horizontal bands in its anterior half, while seven dark and wide bands pass from the back down the sides. A narrow light band goes from the eye to the middle of the base of the caudal fin. Basal third of caudal fin somewhat dark, its outer edge light.

Hab. Kurrachee in Sind.

FIERASFER HOMEI, Richardson.

An example nearly five inches long, from Madras.

EXOCÆTUS ALTIPINNIS, Cuv. & Val.

Exocætus katopron, Bleeker, Atl. Ich. vi. p. 72.

Two specimens up to 11½ inches in length, received from Bombay.

May 15, 1888.

Dr. A. Günther, F.R.S., Vice-President, in the Chair.

The Secretary read the following report on the additions made to the Society's Menagerie during the month of April 1888:—

The total number of registered additions to the Society's Menagerie during the month of April was 63. Of these 11 were by birth, 32 by presentation, 11 by purchase, 2 by exchange, and 7 were received on deposit. The total number of departures during the same period, by death and removals, was 125.

The most noticeable additions during the month were:—

1. Two Penguins from the Auckland Islands, presented by Capt. Sutcliff, R.M.S.S. 'Aorangi,' April 19th. One of them is in adult plumage, the other is young. They are referable certainly to one of the geographical subspecies of *Eudyptes chrysocome*, but on comparing the adult with the example of the Penguin from New Zealand, received March 31st, it will be observed that there are several differences between the two specimens. The Auckland Island bird is larger and not so blue on the back, and has a distinct white line on the lower mandible above the feathering, as will be seen by the drawings now exhibited. Moreover the yellow eyebrow commences much further back, on the lores.

2. Two Indian Hill-Foxes, presented by Col. Alex. A. A. Kinloch, C.M.Z.S., and received April 20th. These Foxes, which, Col. Kinloch informs me, were obtained at Thandiani, a small station on the hills between the Hazara and Jhelum valleys, a few miles from Abbottabad, at an elevation of about 8000 feet, form an acceptable addition to the series of Canidæ in the Society's Collection. They appear to be immature specimens of *Canis montanus*.

3. A fine example of the Spotted Hawk-Eagle (*Spizaëtus nipalensis*) of Northern India, also presented by Col. Kinloch, and new to the Society's Collection.
